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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/880,707	06/12/2001	Daniel Yellin	10559-449001 / P10766	5530
20985	7590	06/13/2006	EXAMINER TORRES, JOSEPH D	
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			ART UNIT 2133	
			PAPER NUMBER	

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/880,707

Applicant(s)

YELLIN ET AL.

Examiner

Joseph D. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) 29-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-13, 16-19 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 29-31 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 29 is directed to SISO decoding properly classified in 714/795. Claims 30 and 31 are directed to a communication system including an encoder and decoder properly classified in 714/776.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 29-31 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. Claims 29-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. This application contains claims 29-31 drawn to an invention nonelected with traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Response to Arguments

2. Applicant's arguments filed 04/21/2006 have been fully considered but they are not persuasive.

The Examiner begins by summarizing the Examiner's previous arguments as it pertains to the Applicant's current response:

Figure 11D in Kobayashi teaches that output from Decoder D_3 and De-interleaver π_{23}^{-1} is supplied to AZD_2 . Decoder D_3 and De-interleaver π_{23}^{-1} are constituent decoding elements in the iterative decoding process of Figure 11D. The output of Decoder D_3 and De-interleaver π_{23}^{-1} is de-interleaved decoded soft output that approximates the actual digital D_3 decoded and π_{23}^{-1} de-interleaved data. AZD_2 is used to modify the approximation of the π_{23}^{-1} de-interleaved D_3 decoded soft output from Decoder D_3 and De-interleaver π_{23}^{-1} by using a finer or coarser quantization for soft data being used. The output of AZD_2 is refined soft data approximating actual digital D_3 decoded and de-interleaved data. Figure 9A and 9B substantially teach a look-up method for translating input values of an AZD into output values; hence an AZD is a look-up process storing discrete output values to which a range of input values are mapped.

Kobayashi explicitly teaches <decoding the encoded packet input to the Decoder of Figure 11D using an AZD look-up table that stores the output value information of Figures 9A and 9B in Kobayashi approximating actual digital D_3 decoded and π_{23}^{-1} de-interleaved output of the Decoder D_3 and De-interleaver π_{23}^{-1} algorithmic decoding process> (Note: the second limitation of the Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that stores information approximating output of

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the algorithmic decoding process”; hence only the underlined elements in the phrase included in <> brackets differs from the Applicant's claim 1).

The Applicant contends, “regardless of how the Kobayashi et al. patent is interpreted, that patent simply does not disclose decoding an encoded packet using a look-up table that stores information approximating output of an algorithmic decoding process, as is recited in claim 1”.

The Examiner disagrees and asserts that Figure 11D in Kobayashi teaches that output from Decoder D_3 and De-interleaver π_{23}^{-1} is supplied to AZD_2 . Decoder D_3 and De-interleaver π_{23}^{-1} are constituent decoding elements in the iterative decoding process of Figure 11D. The output of Decoder D_3 and De-interleaver π_{23}^{-1} is de-interleaved decoded soft output that approximates the actual digital D_3 decoded and π_{23}^{-1} de-interleaved data. AZD_2 is used to modify the approximation of the π_{23}^{-1} de-interleaved D_3 decoded soft output from Decoder D_3 and De-interleaver π_{23}^{-1} by using a finer or coarser quantization for soft data being used. The output of AZD_2 is refined soft data approximating actual digital D_3 decoded and de-interleaved data. Figure 9A and 9B substantially teach a look-up method for translating input values of an AZD into output values; hence an AZD is a look-up process storing discrete output values to which a range of input values are mapped. Hence; Kobayashi explicitly teaches <decoding the encoded packet input to the Decoder of Figure 11D using an AZD look-up table that stores the output value information of Figures 9A and 9B in Kobayashi approximating

actual digital D_3 decoded and π_{23}^{-1} de-interleaved output of the Decoder D_3 and De-interleaver π_{23}^{-1} algorithmic decoding process> (Note: the second limitation of the Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process"; hence only the underlined elements in the phrase included in <> brackets differs from the Applicant's claim 1). That is, Kobayashi word-for-word teaches, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process".

The Applicant contends, "The advisory action's interpretation of the Kobayashi et al. patent also is incorrect because the AZD in FIG. 14B of the Kobayashi et al. patent does not approximately reverse the effect of the random errors that are induced in the signal that is transmitted over the channel of FIG. 14A".

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "does not approximately reverse the effect of the random errors that are induced in the signal") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Applicant contends, "Instead, the AZD merely assigns "erasure symbols" to the ambiguous data".

The Examiner disagrees and asserts that erasure values in Figures 9A and 9B in Kobayashi are soft values indicating the proximity of π_{23}^{-1} de-interleaved D_3 decoded soft output to actual digital D_3 decoded and π_{23}^{-1} de-interleaved data. For example, 'e' in Figure 9B indicates that the received value is ambiguous but that it is closer to 0 than 2 and 'f' in Figure 9B indicates that the received value is ambiguous but that it is closer to 2 than 0. Merriam-Webster's Collegiate Dictionary defines approximation as a mathematical quantity that is close in value to but not the same as a desired quantity. Kobayashi teaches 'e' in Figure 9B is close in value to 0 or 1 but is not the same value as 0 or 1 whereas 'f' is close in value to 1 or 2 but is not the same value as 1 or 2. Kobayashi teaches that providing the additional proximity information in the erasure symbols improves decoding. Furthermore; an output sequence from the AZD_2 unit in Figure 11D is off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the erasure values; hence any output sequence from the AZD_2 unit is an approximation. For example; if the AZD_2 unit produces the following output sequence [110e10202111f], the output sequence is only off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the erasure values and hence is an explicit approximation of the actual D_3 decoded and π_{23}^{-1} de-interleaved data [110a10202111b], where a and b are the actual values of the output sequence.

The Applicant contends, "As applicants best understand the Examiner's position: 1) the noiseless transmission of data across the channel of FIG. 14A somehow is considered

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encoding the data, and 2) the AZD'S processing of the noise-free data it receives somehow is considered decoding the data. That is incorrect. Even if the noise induced by the..."

The Examiner clarifies. Figure 11D in Kobayashi teaches that output from Decoder D_3 and De-interleaver π_{23}^{-1} is supplied to AZD_2 . Decoder D_3 and De-interleaver π_{23}^{-1} are constituent decoding elements in the iterative decoding process of Figure 11D. The output of Decoder D_3 and De-interleaver π_{23}^{-1} is de-interleaved decoded soft output that approximates the actual digital D_3 decoded and π_{23}^{-1} de-interleaved data. AZD_2 is used to modify the approximation of the π_{23}^{-1} de-interleaved D_3 decoded soft output from Decoder D_3 and De-interleaver π_{23}^{-1} by using a finer or coarser quantization for soft data being used. The output of AZD_2 is refined soft data approximating actual digital D_3 decoded and de-interleaved data. Figure 9A and 9B substantially teach a look-up method for translating input values of an AZD into output values; hence an AZD is a look-up process storing discrete output values to which a range of input values are mapped. Hence; Kobayashi explicitly teaches <decoding the encoded packet input to the Decoder of Figure 11D using an AZD look-up table that stores the output value information of Figures 9A and 9B in Kobayashi approximating actual digital D_3 decoded and π_{23}^{-1} de-interleaved output of the Decoder D_3 and De-interleaver π_{23}^{-1} algorithmic decoding process> (Note: the second limitation of the Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process"; hence only the underlined

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elements in the phrase included in <> brackets differs from the Applicant's claim 1).

That is, Kobayashi word-for-word teaches, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process".

The Applicant contends, "In particular, the input/output characteristics of the AZD (see FIG. 9B) does not approximate an algorithmic decoding process. Instead, the input/output characteristics merely assign a non-numeric value (i.e., "e" or "f ") to certain ambiguous data". That is incorrect. Kobayashi explicitly teaches <decoding the encoded packet input to the Decoder of Figure 11D using an AZD look-up table that stores the output value information of Figures 9A and 9B in Kobayashi approximating actual digital D_3 decoded and π_{23}^{-1} de-interleaved output of the Decoder D_3 and De-interleaver π_{23}^{-1} algorithmic decoding process> (Note: the second limitation of the Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process"; hence only the underlined elements in the phrase included in <> brackets differs from the Applicant's claim 1). That is, Kobayashi word-for-word teaches, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process". In addition, Kobayashi teaches 'e' in Figure 9B is close in value to 0 or 1 but is not the same value as 0 or 1 whereas 'f' is close in value to 1 or 2 but is not the same value as 1 or 2. Kobayashi teaches that providing the additional proximity information in the erasure symbols improves decoding. Furthermore; an

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output sequence from the AZD_2 unit in Figure 11D is off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the erasure values; hence any output sequence from the AZD_2 unit is an approximation. For example; if the AZD_2 unit produces the following output sequence [110e1020211f], the output sequence is only off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the erasure values and hence is an explicit approximation of the actual D_3 decoded and π_{23}^{-1} de-interleaved data [110a1020211b], where a and b are the actual values of the output sequence.

The Applicant contends, "The AZD does not approximate a procedure for solving a mathematical problem in a finite number of steps that frequently involves repetition of an operation".

The Examiner asserts that the Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process", that is, the Applicant's own claim language only recites using a look-up table that stores information approximating **output** of the algorithmic decoding process. Nowhere does the Applicant claim a look-up table "for solving a mathematical problem in a finite number of steps".

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a look-up table that stores information approximating output of the algorithmic decoding process) are not recited in the rejected claim(s). Although the claims are interpreted in

light of the specification, limitations from the specification are not read into the claims.

See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Examiner asserts that AZD_2 output does approximate the actual digital D_3 decoded and π_{23}^{-1} de-interleaved **output** of the Decoder D_3 and De-interleaver π_{23}^{-1} of the Decoder D_3 and De-interleaver π_{23}^{-1} procedure for solving the mathematical problem of decoding in a finite number of steps (see previous arguments for details). For example; if the AZD_2 unit produces the following output sequence [110e10202111f], the output sequence is only off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the erasure values and hence is an explicit approximation of the actual D_3 decoded and π_{23}^{-1} de-interleaved data [110a10202111b], where a and b are the actual values of the output sequence.

The Applicant contends, "AZD2 does not store information that approximates an algorithmic decoding process of the encoder E3".

The Examiner asserts that the Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that stores information approximating output of the algorithmic decoding process", that is, the Applicant's own claim language only recites using a look-up table that stores information approximating **output** of the algorithmic decoding process. Nowhere does the Applicant claim a look-up table "for solving a mathematical problem in a finite number of steps".

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In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a look-up table that stores information approximating output of the algorithmic decoding process) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Examiner asserts that AZD_2 output does approximate the actual digital D_3 decoded and π_{23}^{-1} de-interleaved **output** of the Decoder D_3 and De-interleaver π_{23}^{-1} of the Decoder D_3 and De-interleaver π_{23}^{-1} procedure for solving the mathematical problem of decoding in a finite number of steps (see previous arguments for details). For example; if the AZD_2 unit produces the following output sequence [110e10202111f], the output sequence is only off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the erasure values and hence is an explicit approximation of the actual D_3 decoded and π_{23}^{-1} de-interleaved data [110a10202111b], where a and b are the actual values of the output sequence.

The Applicant contends, "There is no disclosure or suggestion in the Kobayashi patent of a look-up table that stores an approximation of a soft-input soft-output, soft-input hard-output, hard-input soft-input or hard-input hard-output algorithmic decoding process".

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Quantized data is soft data. The AZDs in Kobayashi are configured to provide soft information to decoders expecting soft information and that also produce soft information for subsequent use. Decoder D₃ in Figure 11D is a soft-input/ soft output device. Further, any decoder has to fall into one of the categories provided by claim 5, that is, any decoder satisfies claim 5 and claim 5 is equivalent to saying any decoder.

The Examiner disagrees with the applicant and maintains all rejections of claims 1-6, 9-13, 16-19 and 22. All amendments and arguments by the applicant have been considered. It is the Examiner's conclusion that claims 1-6, 9-13, 16-19 and 22 are not patentably distinct or non-obvious over the prior art of record in view of the references, Kobayashi; Hisashi et al. (US 6029264 A, hereafter referred to as Kobayashi) in view of Steele; Raymond (US 4393276 A) as applied in the last office action, filed 11/16/2005. Therefore, the rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-6, 9-13, 16-19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi; Hisashi et al. (US 6029264 A, hereafter referred to as Kobayashi) in view of Steele; Raymond (US 4393276 A).

See the Final Action filed 11/16/2005 for detailed action of prior rejections.

Allowable Subject Matter

4. Claims 7, 8, 14, 15, 20 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. This is a RCE of applicant's earlier Application. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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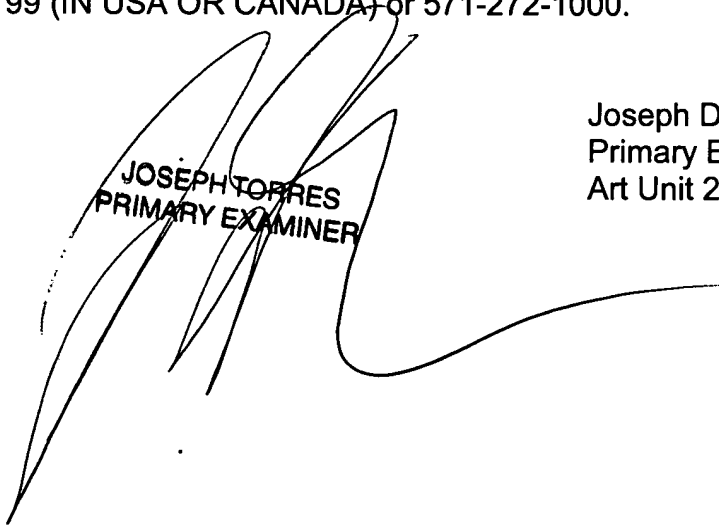
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JOSEPH TORRES
PRIMARY EXAMINER

Joseph D. Torres, PhD
Primary Examiner
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